Economic Policy Reform and Competitiveness Project

DEVELOPING A NATURE RESERVE AT GACHUURT, BAYANZURKH DISTRICT NEAR ULAANBAATAR, MONGOLIA

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Ulaanbaatar

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ABBREVIATIONS

COP	Chief of Party
EPRC	Economic Policy Reform and Competitiveness Project
NGO	Non-government Organization
USP	Unique Selling Point
LSU	Large Stock Unit

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EXECUTIVE SUMMARY

A. Project Development Goal

To develop a Nature Reserve containing non-dangerous wild animals and rare domestic animal species.

The reserve will also serve as a Conservation Hub and a living and dynamic interactive display window for tourists and the Mongolian Public, to show some of the wildlife and eco-regions of Mongolia.

The nature reserve will serve a secondary function as a centre for conservation education at different levels from small children through to University Research level.

B. Covering Development and Operating Costs

Income will be raised through entry fees and activity fees ranging from free entrance, to US$8 to US$10 for foreign tourist entry. Activities will be charged at US$2 to US$4 for an hour. Operating and component funds will be raised through joint development and management projects with (e.g.) Agriculture University of Mongolia, other research organisations and NGOs, and international conservation bodies.

C. Proposed Development Partnerships

Private Sector
Hotels, Chain Stores, Large Corporations, Industry, Private Tour Operators
Research Organisations
University of Agriculture and co-funding partners
Ministry of Nature and Environment - Protected Areas Management
Ministry Roads, Transportation and Tourism – Department of Tourism
International Conservation Bodies
WCS, WWF, UNDP/FAO Gene-pool fund

Additional revenues will be generated through fund-raising activities, annual marketing events and sponsorships.

D. Type of Product

The main component is an open nature reserve with facilities to walk around, or ride a horse, or camel to the areas up on the hill. Additional components will include landscaped areas with plants and wetlands. Additional components will be phased in, when money becomes available, and financial targets are met, or additional partnerships are formed to develop and operate a specific component. These include: a large enclosed aviary, with different landscapes, plants and birds, possibly with small animals, an interactive display and information centre, gradually increasing to large aviary for birds of prey and possibly a small carnivore enclosure.

E. Target Customers

The target customers include high and middle income residents of Ulaanbaatar and their families, tour groups, business visitors and educational groups.

F. Project Management

In the initial stages, the project will be managed by a wildlife vet and manager, under the guidance of a steering committee composed of investors, members of the local *soum*, District Mayor's representative, representatives from co-financing organisations (Universities, research organisations, etc.), and Tourism and Environment representatives from Government.

G. Cost Recovery

G1.Development Costs

Cost recovery will either be very slow, or must be offset against marketing and public relations budgets of investors.

G2. Operating Costs

Operating costs should be covered by entry and activity fees, and through fund raising activities, marketing levies and corporate sponsorships.

Mongolia is very cold in winter and almost all income to cover operating costs must be generated in the summer, with a peak visitor period of approximately 3 months.

Establishment and operating costs are supplied in the table below.

Table 1. Summary of Component Costs

Establishment Costs					
Component 1 Nature Reserve US$	Fixed costs 312,000	Labour 18,000	Equipment 55,000	Supply Animals 75,000	**Total 460,000**
Component 2 Interactive Display Centre US$	Fixed costs 20,000	Labour 3,000	Equipment 2,000	Supply Animals -	**Total 25,000**
Component 3 Wetland Birds US$	Fixed costs 10,000	Labour 3,000	Equipment 2,000	Supply Animals 5,000	**Total 20,000**
Component 4 Open Aviary US$	Fixed costs 70,000	Labour 7,500	Equipment 500	Supply Animals 2,000	**Total 80,000**
Component 5 Raptor Aviary US$	Fixed costs 100,000	Labour 14,000	Equipment 1,000	Supply Animals 5,000	**Total 120,000**
Component 5A Wildlife Rehab. US$	Fixed costs -	Labour 2,000	Equipment 10,000	Supply Animals -	**Total 12,000**
Component 6 Small Carnivores US$	Fixed costs 200,000	Labour 18,000	Equipment 2,000	Supply Animals 10,000	**Total 230,000**
Grand Total	**712,000**	**65,500**	**72,500**	**97,000**	**947,000**

Operating Costs			
Consumables 10,000	Animal Feeds 40,000	Manpower 130,000	**Total 180,000**
Consumables 1,000	0	Manpower 14,000	**Total 15,000**
Consumables 1,000	Animal Feeds 4,000	Manpower -	**Total 5,000**
Consumables 1,500	3,500	Manpower 18,000	**Total 23,000**
Consumables 2,000	Animal Feeds 3,000	Manpower 27,000	**Total 32,000**
Consumables 2,500	Animal Feeds 2,500	Manpower 5,000	**Total 10,000**
Consumables 2,000	Animal Feeds 5,000	Manpower 18,000	**Total 5,000**
20,000	**58,000**	**222,000**	**290,000**

Table 2. Revenue Estimation Calculations

Max No. Visitors	Entry Fee Rate US$	Horse Rides Rate US$/hr	Adventure Zone Rate US$/hr	Max Entry Revenue US$	Horse/Camel Rides Revenues US$	Adv Zone Revenues US$	Max daily Revenues US$
400	8	2	2	3200	80	144	3,436
400	4	2		1600	80	-	1,686
200	2	2	2	400	80	144	630
200	-	-	-	0	-	-	-
						Total	**5,752**
Average revenues from all visitor classes					Average Daily Revenues		1,917
at max 400 visitors/day					30 days revenue		57,520
					180 days revenue		345,120
Assume:	Park is open 12 hours				Monthly Revenue	%	Revenue $
	Most stay 2-4 hours				by % Occupancy	100%	57,520
	~50 people in park at any given time					90%	51,768
	12 Horses & 12 camels					80%	46,016
	Rides last 2-4 hours					70%	40,264
	40 Rides/day max					60%	34,512
	Max 12 people in Adv Zone					50%	28,760
	6 x 2 hrs in Adv Zone					40%	23,008
	72 pax/adv zone/day					30%	17,256
						20%	11,504
						10%	5,752
						5%	2,876
	Weekly Breakdown		Weekly		Monthly		
	% Occupancy		US$		Occupancy Rate		
	25%	Mon	479		5%	Jan	2,876
	30%	Tues	575		5%	Feb	2,876
	25%	Wed	479		5%	Mar	2,876
	25%	Thu	479		5%	Apr	2,876
	40%	Fri	767		30%	May	17,256
	80%	Sat	1,534		60%	Jun	34,512

Max No. Visitors	Entry Fee Rate US$	Horse Rides Rate US$/hr	Adventure Zone Rate US$/hr	Max Entry Revenue US$	Horse/Camel Rides Revenues US$	Adv Zone Revenues US$	Max daily Revenues US$
	80%	Sun	1,534		80%	Jul	46,016
	44%	Average			60%	Aug	34,512
		Total	5,848		40%	Sep	23,008
					10%	Oct	5,752
	Av. By weekly revenues				5%	Nov	2,876
	For 30 weeks		175,436		5%	Dec	2,876
					26%	Average	
					Total Annual Revenue		**178,312**

SECTION I: INTRODUCTION

This project proposal follows an intensive investigation on the feasibility of establishing a Safari Park, a Zoo, or similar concept in a Protected Area near Gachuurt Village. The village is situated approximately 20 km from the centre of Ulaanbaatar and is accessible by tar road. This location will provide a relative advantage for the reserve, in attracting visitors from Ulaanbaatar, as the nearest similar project is at least 1 hour drive further.

The feasibility study has reviewed several possible approaches and recommends that the best approach is to establish a wildlife and nature conservation oriented centre that will also provide a focal point for tourism and serve as an example for sustainable land management in Mongolia.

The project has many beneficial elements apart from direct economic returns to the investor. It is important for the developer to understand that while the project will not generate large profits for the investor, it should be sustainable under good development planning and management.

The main aim therefore, should be to use the project to create a door of opportunity to bring tourism and conservation, and business opportunities to a wide range of visitors and entrepreneurs associated with tourism in Mongolia.

A. Recommended Development Approach

The feasibility study has revealed that there is a great amount of interest in creating linkages between different sectors relevant to Tourism, sustainable Natural Resource use, Environmental Education and Awareness, Community Mobilisation, Applied Research and Wildlife Conservation, all through the creation of the reserve. There are also several ways of achieving this.

The study shows that the project is feasible in the form of a nature reserve, and the next steps to be taken include:

Creating a not-for profit management and ownership body

Finalising land acquisition (according the process as required by law in Mongolia)
Finalising decisions on which wild animal species to introduce
Finalising designs for specific infrastructure required for the project
Ensuring that all negative environmental impacts are mitigated in the project design and/or can be managed under a sustainable environmental management program
Acquiring a sustainable tourist/visitor base to guarantee that the bulk of operating costs can be covered by visitor entrance fees, and what cannot be covered here can be raised by some other means such as fund-raising events and/or sponsorships

B. Project Purpose

The key purpose of the project is to stimulate tourism in Mongolia by:

Encouraging people to stay an extra day in Ulaanbaatar in order to visit the nature reserve.
Providing a venue for local people to spend some of their recreation time throughout the year.
Show tourists and local people some examples of local, naturally occurring wildlife in their natural settings.
Show, through means of an interactive display, the different eco-regions of Mongolia, the types of scenery, wildlife, Nomadic lifestyles and any important features, such as habitats that sustain rare and endangered animals, birds, and plants.

B1.SWOT ANALYSIS

A SWOT analysis (see separate document) of the project elements shows that the key goal of the project fits closely to key purposes in Government Policy on Sustainable Environments, on Tourism generation for Mongolia and on land and forest management and conservation. The analysis also shows that there are many overall benefits in terms of environmental education, opportunities for applied research, and community environmental awareness programs.

The factors identified in the SWOT analysis have also helped to identify a unique selling point for the project.

C. Unique Selling Point

The project's unique selling point (USP) is the capability to bring together Tourism and Tourism-related businesses to a regular exhibition (Tourism Expo). Each year there will be a theme linked to animals, birds, plants and other natural resources, and these can be sponsored by corporate groups and/or individual companies.

The sponsors will get 'free' advertising, while also gaining recognition for contributing to Tourism and Nature in Mongolia. Target sponsorship organisations will include International Airlines, Mining Corporations, Major Industrial/Agricultural Suppliers, Breweries, Hotels, and so on.

D. Initial Project Concept

During the conception phase of the project, various types of exhibits were discussed, more in line with those found in zoos. The purpose of these exhibits was to show the typical landscapes of Mongolia with plants, land formations and animals. This is both difficult to create without doubling up on the existing display in the Natural History, and costly to achieve at a standard of excellence that would be a credit to Mongolia.

With this in mind, the concept was revised and refined until it is now practically and economically feasible and can be developed in a series of stages, as more and more interest is generated in the concept.

The most workable form of exhibit is seen to be a nature reserve, with displays and exhibits that relate the animals in the reserve to their natural habitat and to their usefulness to nomadic people and their ecological function.

Therefore, in addition to having animals in the reserve, there is an accepted requirement for an interactive display centre based on the concept of 'touch-feel-smell', but also with computers, DVD's and other interactive media. The centre should also include products created by the nomadic people from the resources commonly found in different eco-regions of Mongolia.

These displays should be complementary to the displays at the Natural History Museum, and promote the different eco-regions of Mongolia, while providing information on the types of eco-tourism experience that can be gained with different (approved) tour operators.

E. Land Suitability

Having accepted the best approach to the project, the next step has been to determine the land suitability for the purpose of the project.

A series of steps was taken in assessing the land suitability, including estimating the herbage productivity for grazing animals (mainly large herbivores), and the possible impacts of keeping a variety of animals together in a large confined area.

It has been established that an area of approximately 600-800ha will be optimal as a start-up project area. This area may then be expanded, as and when various additional project stages fall into place. Eventually an area of several thousand hectares may be allocated to the project. At this stage, the project should try and form a land management syndicate with other interested and affected parties.

The initial start-up land area requirement is shown **in Figure 1** below.

E.1 Visitor Carrying Capacity

The maximum visitor capacity will be approximately 400, with the operating day split into 4 by 3-hour visitor periods (an average for estimation purposes). This equates to approximately 100 visitors per period. There will be peak visitor times in the day, and peak visitor periods on both a weekly and a seasonal basis. The carrying capacity is set according to the assumption that most visitors will remain near the entry point and/or in areas where wildlife is most commonly seen.

F. Project Components

The project components need to be built up in phases, or modules, according to their perceived viability over time. There are, however, various components that are essential for the operation of the reserve. These components should be started by creating the general nature reserve, with an access and entry point visitor centre, staff and visitor ablutions, management office, vet's office and surgery, animal holding pens, and so on. The various non-dangerous wild and domesticated animals can then be introduced to the reserve. The phased development components should be as follows:

Component 1. The Nature Reserve and Initial Tourist Facilities
Component 2. Interactive Display Centre
Component 3. Landscaped Wetland Area for Water Birds
Component 4. Aviaries for insect and grain-eating birds
Component 5. Raptor Aviaries
Sub-component 5A. Centre for Injured Wild Animals and Birds
Component 6. Small Carnivores Enclosure

F.1 Cost Estimates for the Different Project Components

The cost estimates for the components are supplied according to the major elements for each development stage of the project. These have been broken down for each component in the following sub-sections.

In summary, the expected costs of Component 1 are approximately US$460,000, and first year operating costs approximately US$180,000, while the six month operating season revenues are also expected to be approximately US$180,000 at an average annual 26% of 400 maximum visitors per day. A summary of component costs is supplied at the end of the document.

Some of the start-up costs have been estimated on the high cost side, and initial capital expenditure and operating costs may be reduced, where items can be sourced at lower prices, or labour can be obtained for less than the estimated costs.

The revenues have been calculated on a very low annual visitor rate (44% of maximum recommended number for 30 weeks), but are still expected to (just) cover the annual staff salaries, with most of the winter feed costs also covered.

The capability of the project will rely entirely on increasing revenues by ensuring that the low average annual visitor rate. This is entirely possible, particularly with additional charges levied for viewing the different exhibits.

In addition to the construction costs, there will be work for skilled and semi-skilled labour for a six-month construction period. It is expected that many of these people will be residents of Gachuurt Village.

F.1.1 Component 1. The Nature Reserve and Initial Tourist Facilities

The essential elements needed for the reserve at start-up are:

Game-proof boundary fence
Animal holding pens for introductions and veterinary checkups
Wild animals to stock the park
Entry point/gate & river crossing (bridge/ferry/overhead cable car)
Visitor and staff ablutions – with central heating for winter visitors
Feed storage area
Horses &/or Camels for visitor rides in the reserve
Holding area for horses/camels
Stables/pens for horses/camels
Water supply
Electricity supply – including back-up generator

Component 1. Cost estimates to establish the Nature Reserve

Nature Reserve	Establishment Costs	Operating Costs	Total
US$	460,000	180,000	640,000
Income Generated		180,000	

F.1.2 Component 2. Interactive Display Centre

This project phase should preferably be incorporated with Component 1, although some delays can be expected, and may be to the advantage of the project. The advantages to the project will come from the interest generated among local people when the Display Centre is ready, and which will encourage people to return to the reserve to see each new display that is added over time.

Display Centre components will be:

Large, open building to house the display
Computers and DVD players
Display boards
Display booths
Electricity supply
Water supply
Central heating

In this instance, it would be worth designing the Display Centre with architecture similar to some feature of symbolic importance in Mongolia, such as one of the ancient Buddhist temples, or the fortress of Chinggis Khan.

Component 2. Cost estimates for the Interactive Display Centre

Nature Reserve	Establishment Costs	Operating Costs	Total
US$	25,000	15,000	35,000

F.1.3. Component 3. Landscaped Wetland Area for Water Birds

There are several areas on the project site that are suitable as displays for water birds. One of these areas is close to the best probable location for the access point/entry gate, and a second is further to the west, located on a very small perennial stream. Both areas could be developed over time.

In addition to displaying wetland birds, the landscaping should incorporate plants that provide habitat for nesting and flower displays of indigenous plants. Hopefully these plants will also attract butterflies and other insects, both to add to the attraction of the display, and to provide food for the water and wetland birds.

If the water bird display keeps birds that are unable to fly away for winter, suitable housing should be created for winter shelters in the reserve.

Wetland Display Components:

Landscaping
Indigenous plant displays
Nesting boxes
Over-wintering houses (if necessary) – centrally heated
Electricity supply

Component 3. Cost estimates for the Wetland Birds Display

Nature Reserve	Establishment Costs	Operating Costs	Total
US$	20,000	5,000	25,000

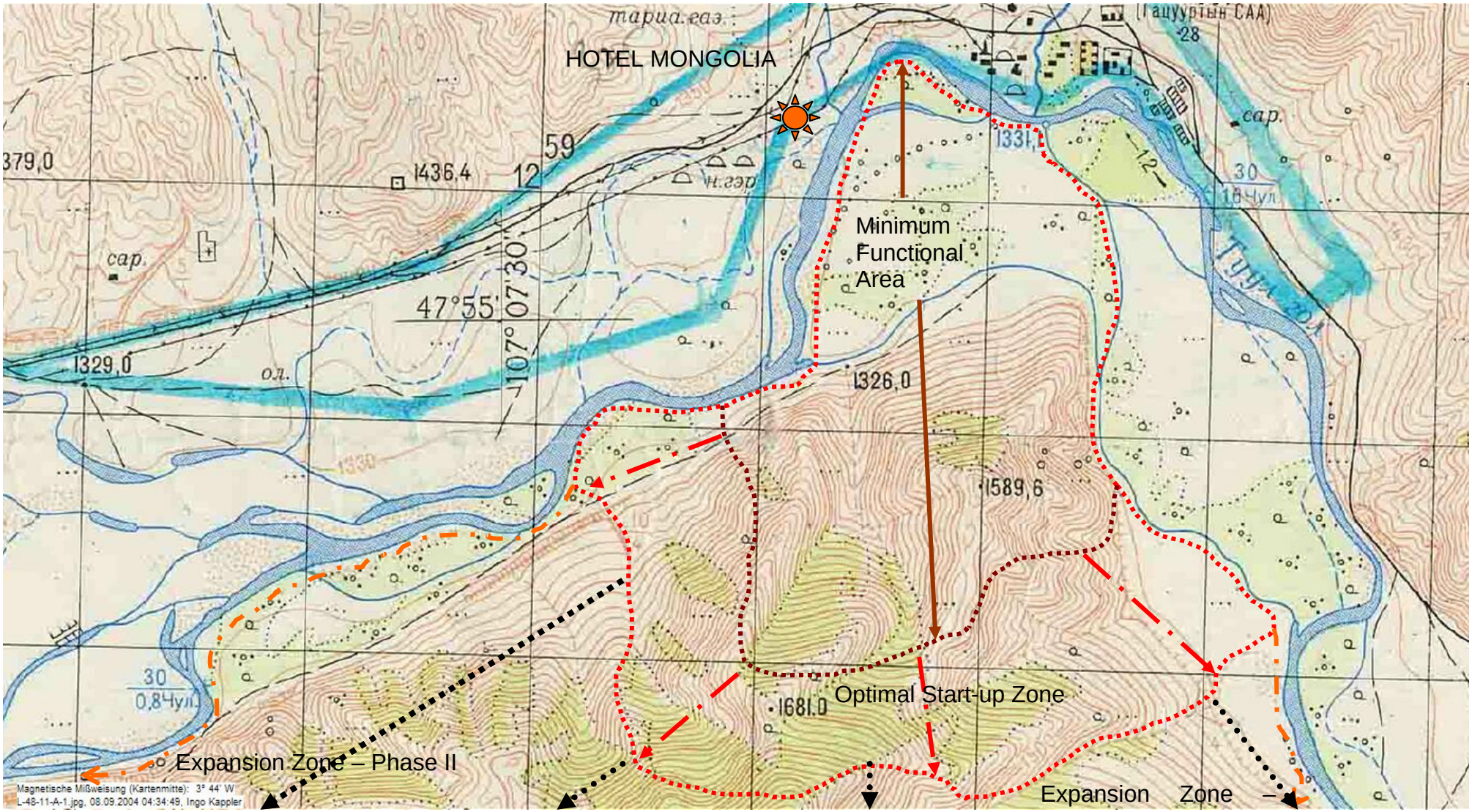

Figure 1. Minimum, Optimum Start-Up & Phased Expansion Zones for Land Acquisition for the Project

F.1.4 Component 4. Aviaries for insect and grain-eating birds

This level of the project will require considerable finance capital to include on the reserve. It should not preclude its development, however, as a considerable tourism market sector (especially Japan and Germany) enjoy this type of experience.

Insectivorous and graminivorous birds can be housed together, as long as there is enough space, and each species has a nesting box and/or refuge area. Modern bird exhibits include large, open aviaries with invisible netting, so that visitors get the impression that they are walking in the open with the birds. It may also be feasible to keep small animals in the aviary, such as rabbits, pikas, small deer species etc. creating a small animal petting area within the protected, enclosed aviary area.

The area can also be landscaped to include trees, bushes and flowering plants that recreate birds' habitats and attract insects etc, to supplement the birds' diet.

Due to very cold winter conditions, heating and glass-house conditions must be created to house the birds and animals in winter.

An alternative to this display is to rely on existing plants, and with some low-intensity landscaping and indigenous tree and shrub planting, merely fence off an 'exclosure' (to keep other animals from eating all the plants). The area can then have laid paths around a series of plant displays, which will naturally attract insects and birds. By carefully siting the initial display, the less costly alternative can eventually be enclosed with invisi-netting, as/when money becomes available.

The aviary display could also incorporate butterfly displays, by hatching butterflies in special boxes, then releasing them into bird aviary. Care should be taken, however, to ensure that non-poisonous butterfly species are introduced, as some are poisonous to birds.

Open Aviary Components:

Landscaping
Indigenous plants
'Invisi-netting' aviary covering and support structures
Glass cover (greenhouse[s]) for winter shelters
Nesting boxes
Birds
Ground-level palisade fencing for plant displays and small animal runs
Small animals for the petting area
Butterfly breeding room
Water supply
Feed supply store and preparation area
Central heating system

Low-cost/start-up alternative

Landscaping
Indigenous plants
Nesting boxes
Ground-level palisade fencing for plant displays and small animal runs
Small animals for the petting area
Water supply

Component 4. Cost estimates for the Bird Aviary

Nature Reserve	Establishment Costs	Operating Costs	Total
US$	80,000	23,000	103,000

F.1.5 Component 5. Raptor Aviaries

This phase of development is considerably more complex and costly than the previous five development components.

Raptors will need either separate enclosures, or separate cages, with access to a large, open flying (exercise) area. The displays can be covered in 'Invisi-netting', but visitors can/should not enter the cages, as many species (especially vultures) are highly-strung and suffer stress from being disturbed by people. It is best therefore to construct special viewing areas in discreetly concealed locations for visitors, where they can look at the birds through glass, or from a darkened, open hide for purposes of photographing the birds.

As for lower-cost displays, some landscaping is required. Many raptor species are tolerant of/adapted to very cold conditions for extended periods, especially species that fly at very high altitudes. They should, however, be provided with warm housing option such as a nesting area out of the cold wind, with low-level central heating. Smaller birds, and migrants should be given winter housing with central heating.

As a possible alternative for project start-up, is to keep hunting hawks, and display them out of doors at festivals and other peak tourist periods. Care should be taken not to offend certain types of visitors who do not like to see animals being killed, so birds should be trained to fly to dead 'prey' during such exhibitions.

Raptor Aviary Components:

Landscaping
Indigenous plants
'Invisi-netting' aviary covering and support structures
Individual bird species displays
Glass cover (greenhouse[s]) for over-wintering
Nesting boxes
Birds
Water supply
Feed supply store and preparation area
Central heating system

Low-cost/start-up alternative

Raptor house
Bird cages
Jessie's and other equipment
Feed storage and preparation area
Water supply

Component 5. Cost estimates for the Raptor Aviaries

Nature Reserve	Establishment Costs	Operating Costs	Total
US$	120,000	32,000	152,000

F.1.5.1 Sub-Component 5A. Centre for Wildlife Rehabilitation

The centre can be created at this stage of development at very little extra cost, as additional expenditure is on extra cages for animals, for an additional staff member to look after animals, and additional expenditure on consumables in the vet surgery.

Component 5A. Cost estimates for the Centre for Wildlife Rehabilitation

Nature Reserve	Establishment Costs	Operating Costs	Total
US$	12,000	10,000	22,000

F.1.6 Component 6. Small Carnivores Enclosure

An enclosure for small carnivores will need several hectares of land, with different types of landscaping and fencing for the different types of animals. Wolves, foxes and other canine family types are likely to try and dig their way out of captivity, while felids (cat family) will climb and jump out. In addition, if animals are very shy, or nocturnal, it will be difficult to see them in large open spaces. The design will therefore require specialised designs, including buildings where visitors can see animals under darkened conditions, and in sound-proofed conditions e.g. from a viewing room, through one-way glass panels.

At this stage of development, therefore, the costs of constructing and maintaining displays, will rise by a factor of 10 times (per display) over the previous level. Also, the nature reserve concept will be approximating a zoo. The project will required staff who specialise in managing wild carnivores and operating and maintenance costs will place a significant financial burden on other displays and the overall nature reserve.

Component 6. Cost estimates for the Small Carnivores Enclosure

Nature Reserve	Establishment Costs	Operating Costs	Total
US$	230,000	25,000	255,000

F.1.6.1 Alternative Approach

The recommendation here is to try and develop a different approach to keeping wild carnivores in the nature reserve.

The project should succeed, and in doing so, will generate interest in replication in other parts of the country. At the same time, however, new ideas and approaches will be developed concerning the management of protected areas and the re-introduction of wildlife.

As an example, interest already exists in farming Eurasian Red Deer and various other antelope species. The areas adjacent to the nature reserve are suited to, and an extensive area could be set aside for this purpose. This need not be undertaken by the nature reserve developer, however, but a separate organisation.

Once contiguous areas of land have been set aside for various types of wildlife management and conservation enterprises, the whole area could be combined into a land management syndicate.

To return to the point about small carnivores; at the point of developing the land management syndicate, it is highly probable that the wildlife populations, under their protected status and active management in the area, will grow significantly. At this stage, it is possible to establish wildlife viewing facilities at locations where the animals are known to frequent.

While this alternative approach will take some time to achieve, it will generate new eco-tourism related activities and opportunities, and will serve the initial purpose of conserving wildlife, and bringing them closer to the common tourist/visitor categories (i.e. urban, family, and business purposes).

Workings Calculations for Estimating Animal Carrying Capacity in the Nature Reserve

The estimations for animal carrying capacity have been developed on the premise that the reserve will be 300-400 ha minimum and 600-800 ha optimum area at start-up. These

estimations have been derived from a rapid field assessment, and cross-correlation of the assessment with a topo-cadastral survey map of the area. The land was divided into zones according to slope, aspect and perceived productivity within these zones.

To determine the carrying capacity, certain assumptions have been made, as follows:

A single Large Stock Unit (LSU or ~ 500kg cow that is growing and reproducing sustainably, or 6 sheep equivalents) requires 30 kg dry matter per day.
The hillside produces forage for six months of the year, and for the remaining 6 months, animals must be fed on hay and/or grain.
The dry matter forage production values are applied over a 365 grazing days/year value
The carrying capacity estimates could be applied over half a year – to double the estimated carrying capacity, but the calculations have purposely erred on the low side, as wild animals are able to forage throughout the winter period, and also the lower estimated initial carrying capacity allows room for increasing stocking rates, once the environmental impacts of keeping large wild herbivores in a limited area have been established
There are four levels of production in terms of dry matter (d.m.) of forage per year, within the proposed reserve area:

Highly productive land (6-10T d.m. /ha) covering ~10% of the area
Moderately highly productive land (4-6T d.m./ha) covering 20% of the area
Moderately low productive land (2.5-4T d.m./ha) covering 30% of the area
Low productivity land covering (1.5-2.5T d.m./ha) 40% of the area
1 T/ha d.m. is not available over all land types, as it cannot be reached (too high off the ground), or is too close to the ground for most grazers to eat.

The resulting estimates provide a carrying capacity of 75LSU equivalents for the ~300ha minimum functional zone of the park, which includes a large portion of 'fence-able' floodplain, plus part of the hillside, and an additional 50LSU for an additional ~300ha of hillside and forest area. These areas are shown in the map in **Figure 1**, below.

G. Proposed Wildlife Species and Numbers

The recommended numbers of wild herbivores and suitable species should be confirmed by a local wildlife expert, but the estimated numbers have been provided to show how the carrying capacity estimates can be applied. Again certain assumptions have to be made, but once understood, this provides management with the capability to adapt numbers according to availability of the various species to be stock in the reserve. The first assumptions made reflect the average LSU equivalents for each species that could be introduced to the reserve. These numbers are given following Figure 1 below.

Average LSU Equivalents of Wild Herbivores

1 Moose = 1.5 LSU
1 Siberian Red Deer = 0.75 LSU
1 Argali = 0.3 LSU
1 Siberian Ibex = 0.3LSU
1 Bactrian Camel = 1.5 LSU
1 Horse = 0.75 LSU
1 Reindeer = 0.5 LSU
1 Yak = 0.5 LSU
1 Siberian Roe deer = 0.15 LSU
1 Siberian Musk Deer = 0.1LSU

H. Number of Animals to be introduced

The number of animals to be introduced can be offset against the estimated carrying capacity by subtracting each additional set of animals for a specific species from the maximum recommended carrying capacity of 125 LSUs as follows:

LSU Value	LSU Balance (Total LSU = 125)	
12 Horses x 0.75	8	117
12 Bactrian camels	18	99
40 Red Deer	30	66
10 Moose	15	61
30 Siberian Ibex	10	51
30 Argali	10	41
20 Yak	10	31
30 Reindeer	15	16
20 Siberian Roe Deer	3	13
10 Siberian Musk Deer	1	12
Total Number of Animals		**224**
Balance		12 (LSU still available for additional species)

The estimated total cost of these animals is approximately US$73,000, with an additional US$12,000 for delivery, to a total of US$85,000.

Table 3. Summary of Component Costs

Establishment Costs						Operating Costs			
Component 1 Nature Reserve US$	Fixed costs 312,000	Labour 18,000	Equipment 55,000	Supply Animals 75,000	**Total 460,000**	Consumables 10,000	Animal Feeds 40,000	Manpower 130,000	**Total 80,000**
Component 2 Interactive Display Centre US$	Fixed costs 20,000	Labour 3,000	Equipment 2,000	Supply Animals -	**Total 25,000**	Consumables 1,000	0	Manpower 14,000	**Total 15,000**
Component 3 Wetland Birds US$	Fixed costs 10,000	Labour 3,000	Equipment 2,000	Supply Animals 5,000	**Total 20,000**	Consumables 1,000	Animal Feeds 4,000	Manpower -	**Total 5,000**
Component 4 Open Aviary US$	Fixed costs 70,000	Labour 7,500	Equipment 500	Supply Animals 2,000	**Total 80,000**	Consumables 1,500	3,500	Manpower 18,000	**Total 23,000**
Component 5 Raptor Aviary US$	Fixed costs 100,000	Labour 14,000	Equipment 1,000	Supply Animals 5,000	**Total 120,000**	Consumables 2,000	Animal Feeds 3,000	Manpower 27,000	**Total 32,000**
Component 5A Wildlife Rehab. US$	Fixed costs -	Labour 2,000	Equipment 10,000	Supply Animals -	**Total 12,000**	Consumables 2,500	Animal Feeds 2,500	Manpower 5,000	**Total 10,000**
Component 6 Small Carnivores US$	Fixed costs 200,000	Labour 18,000	Equipment 2,000	Supply Animals 10,000	**Total 230,000**	Consumables 2,000	Animal Feeds 5,000	Manpower 18,000	**Total 25,000**
Grand Total	**712,000**	**65,500**	**72,500**	**97,000**	**947,000**	**20,000**	**58,000**	**222,000**	**290,000**

Table 4. Revenue Estimation Calculations

Max No.	Entry Fee	Horse Rides	Adventure Zone	Max Entry Revenue	Horse/Camel Rides Revenues	Adv Zone Revenues	Max daily Revenues
Visitors	Rate US$	Rate US$/hr	Rate US$/hr	US$	US$	US$	US$
400	8	2	2	3200	80	144	3,436
400	4	2		1600	80	-	1,686
200	2	2	2	400	80	144	630
200	-	-	-	0	-	-	-
						Total	**5,752**

Average revenues from all visitor classes	Average Daily Revenues	
at max 400 visitors/day	30 days revenue	1,917
		57,520
	180 days revenue	345,120

Assume:	
	Park is open 12 hours
	Most stay 2-4 hours
	50 people in park at any given time
	12 Horses & 12 camels
	Rides last 2-4 hours
	40 Rides/day max
	Max 12 people in Adv Zone
	6 x 2 hrs in Adv Zone
	72 pax/adv zone/day

Monthly Revenue by % Occupancy	%	Revenue $
	100%	57,520
	90%	51,768
	80%	46,016
	70%	40,264
	60%	34,512
	50%	28,760
	40%	23,008
	30%	17,256
	20%	11,504
	10%	5,752
	5%	2,876

Weekly Breakdown % Occupancy		Weekly US$
25%	Mon	479
30%	Tues	575
25%	Wed	479
25%	Thu	479
40%	Fri	767
80%	Sat	1,534
80%	Sun	1,534
44%	Average	
	Total	**5,848**
Av. By weekly revenues		
For 30 weeks		175,436

Monthly Occupancy Rate		
5%	Jan	2,876
5%	Feb	2,876
5%	Mar	2,876
5%	Apr	2,876
30%	May	17,256
60%	Jun	34,512
80%	Jul	46,016
60%	Aug	34,512
40%	Sep	23,008
10%	Oct	5,752
5%	Nov	2,876
5%	Dec	2,876
26%	Average	
Total Annual Revenue		**178,312**

SECTION II: ENVIRONMENTAL LEGISLATION IN MONGOLIA

Environmental Protection Law
Special Protected Areas
Environmental Impact Assessment
Land Law
Land Fee
Land Ownership
Water Use
Forest Protection
Soil Conservation
Tourism

SECTION III: ENVIRONMENTAL ORGANIZATIONS IN MONGOLIA

A. Government

Ministry of Nature & Environment
Ministry of Roads, Transport & Tourism
Local Land Administration

University of Agriculture

- Range Ecology Dept. research on ethno-botany for human and veterinary medicine, land rehabilitation, baseline plant inventories in the reserve, land suitability, climate change: Dr. Undarmaa Jamsran tel: 11 341549
- Veterinary Dept. rare livestock breeds, pathology and epidemiology

Academy of Science

- Dr. Lhagvasuren – mammal specialist
- Dr. Tseveen Myadaj - Ornithologist

B. Non-Government

Wildlife Conservation Society
World Bank GEF Project on Sustainable Livelihoods in E Mongolia D. Galbadrakh
WWF World Wildlife Fund
GTZ Forestry Mongolia – Hans Hoffman tel: 11 312282
Small NGOs

SECTION IV: ENVIRONMENTAL GUIDELINES AND CODE OF CONDUCT

Many of the points raised below may seem obvious and unnecessary. Construction work should be conducted in an environmentally and socially sensitive and responsible manner. These guidelines are intended to ensure that all parties involved are aware of the potential impacts of their activities and carry out the work in an appropriate way.

They are designed as a written Statement of Intent for project managers to adhere to, and to which recourse can be made in the event of perceived undesirable impact. They should therefore be included in all contracts for construction and related work. Project managers are required to familiarize all employees with the contents and spirit of these guidelines. This document will be made available to Central and Local Government authorities and conservation bodies during normal consultative procedures.

A. Camps

If and when new field camps for labour are needed, their construction and removal should be carried out along the following lines:

- Permission for camp areas must be obtained from the local *soum*.
- Access roads and the camp areas should be sited to cause minimum disturbance; no large trees should be cut down; the use of firewood must be restricted to dead wood only and should not conflict with the needs of residents in the area.
- No permanent structures are to be built.
- The camp is to be removed, site cleared and all scrap removed at the end of construction.
- All rubbish except oils and other mechanical or chemical waste is to be removed to Government/municipality designated dumping sites or recycling plants.

B. Human Relations

- People's water, lands and livestock must be respected.
- All conflicts/disagreements and any agreements (use of grazing, etc.) no matter how trivial, must be logged and dated, with details of persons involved and subject matter, in a book for this purpose at base camp.

C. Cut Lines for Fences, and Access Roads

- During cut line clearing, large trees should be left, and if necessary the access (driving) track routed around them. The lower branches of these trees may be trimmed to open a line-of-sight. This leaves a nucleus for seed production to allow rapid recovery of the area.
- Cut lines and access routes should not be graveled without at least an environmental screening assessment.

- Hill sides should not be disturbed by vehicle tracks as these may cut and erode further.

D. Water Supply

Tuul River

- No spillage of oils or fuel should occur in the vicinity of boreholes or wells.
- Water abstraction rights must be obtained from the relevant authorities.

Reservoirs and Transfer Points

- All water storage should be constructed in such a way to make sure that it does not dominate the local landscape

SECTION V: EVALUATION AND MONITORING OF THE PROJECT

Factor	Approach, Data Type
Soil	Types, areas of disturbance
Water Resources Supply	Well logs, stream flow records, geology records
Water Quality	Well logs, physico-chemical and biotic recordsand surveys
Biota	Harvest reports, population statistics,abundance and diversity records, vegetation densities, animal-vehicle traffic accident records, road kill counts
Development Economics	Dichroic comparisons, commodity trade and price records, Household income and distribution surveys, Infrastructure inventories
Land Use and Tenure	Land use areas from remote sensing images, property records, maps, cadastral surveys
Accessibility	Proximities, travel time and mode surveys
Attractions and Displacement	Structure counts, grazing-foraging/other land areas, displacement-resettlement records, employment statistics, Census reports
Community Cohesion	Construction and operation patterns, socio-economic surveys residential activity trends
Health	Construction and operations aspects, clinic records, medical reports and statistics
Safety	Accident/injury records, traffic counts, safety inventory
Vandalism and Theft	Camp security records, local police reports
Aesthetics	Proximities, view line areas, rating scales, opinion surveys
Historical, Archeological	Officials and residents consultation, government listings, and Spiritual Resources tourism reports, site maintenance records
Air Quality	Traffic counts and O-D surveys, ambient air quality records, traffic projections, meteorological records, vehicle emission tests and reports
Noise Pollution	Loudness survey records, traffic counts and projections, terrain parameters
Road Maintenance	Drain maintenance reports, supplies inventory records, monitoring/rehabilitation records and reports
Environmental Protection Measures	No. Planned/done
Project manager/Consultant Training	No. materials prepared, no. participants
Mitigation-Enhancement Training	No. materials prepared, no. participants

Mitigation-Enhancement Development Projects	No. planned/done, contracts record
Environmental Management	Advisory group feedback, ratio of tasksplanned/done, effectiveness ratings
Project manager Requirements	No. scheduled/completed
Local Employment and Supplies	No./sex employees, amount of supplies
Land Rehabilitation/ Protection	No. sites involved/done
Landscape Revegetation	No. sites involved/done
Wastes Management	No. facilities, no. trainees, pollution records, disposal reports
Resource Protection	No. sites available/used, areas involved
Archeological Protection	No. training sessions, no. artifacts, frequency Activities of archeologist involvement
Consultations with Local Officials	No. types, contacts/decisions made records
Cooperation on Environmental Program	Contracts record, evaluation scale

SECTION VI: COST ESTIMATES OF ENVIRONMENTAL PROGRAM

Tugriks

Item	Unit Cost	Foreign Exchange	Local Currency	Total
Short -Term Consultancy Services				
Project manager Crew briefing on site				
Workshops preparation and implementation (4)				
Archeological, Legal, etc(4 man-months)				
Roads Department Facilitation				
Training and Coordination Meetings				
Workshop participants(x persons each)				
Coordination meetings (x persons, y meetings)				
Maps and aerial photographs				
Community Development Assistance				
Use of heavy equipment for n days				
Base Technical support*				
Physical Contingency (10 percent)				
Total				
Taxes		-		

* Cost estimates do not include Environmental Protection items such as drainage works in the construction budget.

SECTION VII: INCLUSIONS FOR TENDER DOCUMENTS

Adapted from African Development Bank, 1991

Example drawn from Standard Specifications for Road and Bridge Works. November, 1983. Volume III. Botswana Roads Department, Ministry of Works and Communications: Gaborone. The Project manager will follow the Environmental Guidelines and Code of Conduct. Other specific measures include items in the following paragraphs:-

A. Baseline Land Systems Inventory

Appropriate scientists shall be consulted upon flora that are likely to be found within the reserve and that are designated for protection. The project manager shall obtain drawings or pictures of these species, information on their habitat requirements, and recommended measures for protecting (and/or transplanting) these vegetation. The project manager shall designate particular staff who are responsible to identifying these flora in the road reserve, and carrying out the protective measures.

Wherever feasible, combustible vegetative materials that are not retained for project use, and are suitable for firewood, will be gathered and stored at points of access to local residents for their use. Commercial vendors will not be given access to these materials. Where amounts of materials are excessive, they will be piled in rows along the edges of the reserve furthest from the road, but not so as to hinder sight lines for drivers of vehicles.

B. Physical Infrastructure Development

For structures with unattractive features, the project manager will construct a low earth berm planted with a line of appropriate shrubs and trees to serve as a visual screen between the unattractive sites, and the visitor sections of the reserve. The access tracks that connect the road to the sites will be placed obliquely at the sides of the sites, rather than direct connections to the road, so as to reorient travelers ╒ sight lines away from unattractive views.

Where these areas are inundated, the project manager must contact public health officials and veterinarians for inspection and written comment on the need for protection of the areas against the potential transmission of diseases e.g. anthrax.

Depending upon the types of sanitation treatment system used, the project manager also may have to periodically drain the septic tanks, adjust from the site, as appropriate. Coordination with health officials in regard to treatment of area residents also may be required.

Although potential the nature reserve area is within a Protected Area, the project manager will consult with local authorities in the vicinities of the respective sites as ascertain the relative importance of local sites in regard to grazing, water catchment, and other hand uses. Where feasible, the project manager is to minimize the area disposed from the local community. The Project Manager will decide upon these tradeoffs, based upon information collected from local

authorities, and the original geo-technical data, plans, and schedules.

C. Fencing

This section also pertains to temporary or permanent fences to be used in environmental protection of construction areas, landscaping and grassing, and other appropriate environmental protection measures.

D. Landscaping and Grassing

Mulch: A mulch of straw or similarly appropriate material shall be used to enhance the germination, and/or growth of planted grass seeds or cuttings. This mulch will retard desiccation of the growing vegetation, and allow a better cover to become established.

Protection. Wherever grassing is required, appropriate protection must be given to the growing vegetation. This can be accomplished by temporary fences, and/or a dense vegetative mat (e.g., cut tree branches) that are resistant to cattle and other herbivores.

C. Addendum - New Sections

C1. Wastes Disposal

The Project Manager must manage sanitary and solid wastes in accordance with accepted practices for the protection of public health and environmental ecosystems. In regard to sanitation, this includes aerated toilets, portable chemical toilets, protected water supplies, hygienic eating areas, and other facilities commonly used at construction sites. Separate toilet facilities must be provided for men and women. A program for monitoring the sanitation conditions will be established.

Solid wastes will be managed as to appropriate disposal and recycling options. This involves facilities and procedures for the separation and storage of various waste (e.g., metals, plastics, paper, spent petroleum liquids) materials. Workers must be given training as to expected wastes management procedures.

C2. Hazardous Substances

Petroleum products, paints, cleaning solvents, explosives and other substances often are hazardous to handle, and are a threat to people and the environment. Workers must be given equipment, work training, and safety and first aid training for dealing with hazardous substances. This includes establishing an emergency response plan, and emergency response procedures.

The project manager is to develop plans, procedures, equipment, and training for the storage and transport of hazardous substances. These considerations include the provision of special containers, special storage areas (e.g. an earthen dike around the bases of large tanks of fuel, or asphalt materials to contain spills if a container should rupture), and procedures for controlling the transport and disposal of hazardous substances. The project manager is to consult with emergency response officials, where appropriate, on these matters.

C3. Archaeology

The project manager will make arrangements with archaeologists for dealing with artifacts or other cultural remains encountered in construction of the road. These activities include (1) develop a short briefing program for educating construction workers about what to look for; what to expect during clearing, grubbing, earth-moving or other activities; what procedures to follow, if archeological evidence is found. The archaeologist may need to be hired to develop this brief training package of policy, procedures, and pictures for training workers; (2) establish procedures for rapid interactions with archaeologists if artifacts or other cultural evidence is found. This will include cessation of work at, and in the surrounding area where the discoveries are made until the archeologists can evaluate the situations; (3) assist the archaeologists in rapid salvage explorations and reclamations, as necessary. The Project Manager will have final authority on making decisions about archeological findings.

C4. Human Resources

The consultant will develop and execute a plan that involves the maximum use of local labor, where feasible. Qualified women will be given hiring priority. The Project Manager will decide upon the appropriateness of the project manager's plan, and hiring practices in regard to this requirement.

C5. Local Procurement

Where feasible as to dependability, quality and costs, the project manager shall give procurement priority to local vendors of goods and services that are used in the construction of the road. The Project Manager will decide whether this requirement is being fulfilled.

C6. Local Consultation

The project manager will consult with local authorities on topics that include, but are not limited to, the following considerations: facilitation of labor and supplies, labor relationships, control of undesirable vendors, locations of construction camps, locations of lay-byes and the rest areas; functions of pans, boreholes, and other local resources, the acquisition of leftover construction materials and reusable debris (e.g. poles, empty drums, excess fencing materials). The project manager will keep records of consultations, decisions, and actions with local authorities. The

Project Managerwill have final authority over matter involving local authorities.

C7. Excess Materials and Reusable Debris

Where it will be uneconomical for the project manager to remove excess materials (e.g. poles, lumber) or reusable debris (e.g., empty drums), the project manager will sell by means of auction or other suitable arrangement these materials to local communities. Local government will have priority over local private vendors or individual persons for the purchase of these materials. The Project Manager or his designated representative will approve the financial arrangement, and will inspect and mark the lots of materials designated for local transfer prior to their disposal. The Project Manager will have the right to revoke all plans and arrangements in regard to these sales if improprieties are evident.

C8. Wage Payment Program

With the written concurrence of individual workers, the project manager will withhold one-fifth of employee wages, with interest accumulation at the prevailing commercial rate, for payment to the participating employees at the end of their employment tenure. This, in essence, will constitute a self-financing savings program for project employees.

C9. Local Development Assistance

Where participation in local affairs does not hinder project progress, the project manager will render minor assistance to local community development projects (e.g. use of a road grader for a short time to make a lane to a school building, use of a watering truck for a few hours to establish a community wood lot project). All such requests for assistance must be reviewed and approved in advance by the Project Engineer.

C10. Environmental Program Participation

The project manager will cooperate on all policies, monitoring, and other activities of the environmental program for the road project. This will involve the assignment of project manager employee(s) to assist in activities such as contacts with officials and professionals, keeping records of materials used and actions performed, conducting studies, allowing inspections of environmental protection works, and other environmental tasks.